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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/560,054

05/16/2006

Christian Monereau

Serie 6169

9670

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09/10/2008

AIR LIQUIDE

Intellectual Property

2700 POST OAK BOULEVARD, SUITE 1800

HOUSTON, TX 77056

EXAMINER

LAWRENCE JR, FRANK M

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

09/10/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/560,054	Applicant(s) MONEREAU ET AL.	
	Examiner Frank M. Lawrence	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 11-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/8/05</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: A brief description of each figure of drawings is required. The use of section headings such as “Background” and “Summary of the Invention” is also suggested.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 12-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Each of claims 12-20 is indefinite because it depends from a canceled claim.

Each claim should be amended to depend from claim 11 to overcome this rejection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 11-16, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bosquain et al. (4,451,851).
6. Bosquain et al. '851 disclose a TSA prepurifier for treating air being sent to cryogenic distillation, comprising at least one adsorbent vessel containing alumina and zeolite X for

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removing impurities, and a filter (26) downstream of the adsorbents, wherein feed air flows centripetally through the adsorbents and heated nitrogen regeneration gas from distillation flows centrifugally through the beds to desorb the impurities (see figures, col. 4, lines 9-20, claim 22). About 40% of produced nitrogen is used for regeneration, which equates to less than 33% if up to all the nitrogen in an air stream (78% N₂) is recovered after distillation (col. 10, lines 11-21). The nitrogen is heated by the thermal exchange line of the distillation column and heating is controlled so that a heat front through the beds never reaches the vessel outlet (col. 5, lines 26-53). During a second part of regeneration, heating is stopped to cool the beds (col. 7, lines 1-19). One skilled in the art would understand that the use of more than one vessel would include using temperature swing adsorption.

7. The instant claims differ from the disclosure of Bosquain et al. '851 in that the adsorption time is between 90-120 minutes. Absent a proper showing of criticality or unexpected results, the adsorption time is considered to be a parameter that would have been routinely optimized by one having ordinary skill in the art in order to optimize a regeneration cycle based on adsorbent capacity and desorption time.

8. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bosquain et al. '851 in view of the European Patent Application (EP 0766989 A1).

9. Bosquain et al. '851 disclose all of the limitations of the claim except that the heat exchanger includes a bypass. EP '989 discloses a TSA system comprising an external regeneration gas heat exchanger (62) with a bypass line (64). It would have been obvious to one having ordinary skill in the art to modify the heat exchanger of Bosquain et al. '851 by using a

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bypass line in order to provide cooled regeneration air to bring the adsorption beds back to adsorption temperature before supplying feed gas.

10. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bosquain et al. '851 in view of Monereau et al. (6,402,809).

11. Bosquain et al. '851 disclose all of the limitations of the claim except that the zeolite is a binderless LSX type zeolite. Monereau et al. '809 disclose a TSA system for prepurifying air, comprising an alumina bed upstream of an LSX bed (claim 5, abstract). It would have been obvious to one having ordinary skill in the art at the time of the invention to use LSX zeolite in the system of Bosquain et al. '851 in order to provide an adsorbent that is effective for removing targeted impurities from air and allow more effective cryogenic separation. One skilled in the art would also know to select binderless zeolite when agglomerated particles are not needed (pressure drop not an issue) and adsorbent surface area must be maximized.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additional references listed on the attached PTO-892 form disclose adsorbent bed systems and receptacles.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frank M. Lawrence whose telephone number is 571-272-1161. The examiner can normally be reached on Mon-Thurs 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Frank M. Lawrence/
Primary Examiner, Art Unit 1797

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